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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Fatter Steers

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A SCIENCE SERVICE PUBLICATION

MEDICINE

# New Anthrax Vaccine

**New vaccine against the deadly disease wins Dr. George G. Wright the Army's highest award to civilians. The vaccine is made by filter method.**

➤ A NEW vaccine against a deadly disease once feared as an agent of germ warfare has been made by Dr. George G. Wright at the Army's biological warfare center at Camp Detrick, Md.

For this achievement Dr. Wright received the Army's highest award to civilians, the Exceptional Civilian Service Award.

The new vaccine has been given safely to 660 volunteers. These people are likely to be exposed to the disease in the course of their work with the hair and hides of animals. Anthrax is primarily a disease of cattle and sheep, but humans can get it from infected animals. Woolsorters' disease is an old name for it.

How effective the new vaccine will be in protecting humans cannot be told for some time because anthrax now is relatively rare and it may be a long time before any of the vaccinated are exposed to it.

At the meeting of the Society of American Bacteriologists early in May Dr. Wright reported that the new vaccine will be effective against a wide range of strains of anthrax germs. This was determined through laboratory tests.

The new vaccine is made by a new method which may become a model for making other vaccines. Former vaccines against anthrax, dating back to the time of Pasteur, were made from attenuated, or weakened, spores of the anthrax germs. They never were considered safe enough for humans because of the danger that live germs might develop from the supposedly harmless spores. These vaccines, however, have been used on cattle.

Dr. Wright's vaccine is made by filtering cultures of the anthrax germs. The germs are grown on a chemical growth mixture without any blood serum, so there is no danger of serum sickness from the vaccine. This germ culture is put through a special filter which holds back the germs but lets the antigen go through. The antigen without the germs does not cause disease but does call up anthrax-fighting antibodies in the animal or human body.

Dr. Wright thinks in the future scientists may pay more attention to filtrates from germ cultures, instead of the germs, in their search for better vaccines against other diseases.

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MEDICINE

# Bronchitis Treatment

➤ CHRONIC BRONCHITIS, probably the most common chest condition doctors see, should get more vigorous treatment than it usually does, Dr. David H. Waterman of Knoxville, Tenn., declared at the meeting of the National Tuberculosis Association in Milwaukee.

Stopping smoking is part of the vigorous treatment Dr. Waterman and associates have found helpful in over 3,000 cases of chronic bronchitis treated during the past eight years.

Chronic bronchitis, Dr. Waterman said, is a disease in itself, although it may also be found in such other chest diseases as pulmonary emphysema, silicosis, soft-coal workers' pneumoconiosis, bronchiectasis and asthma.

It is a relatively painless but highly resistant type of infection, Dr. Waterman said.

Most important of the vigorous measures of treatment is a "well-performed bronchoscopy." In this, the upper air passages are examined with a special instrument of tube, lights and mirrors and fluid is sucked out. Use of medicines to help the patient cough up material from the lungs, giving large amounts of fluids, postural drainage and inhalation treatment are other measures in the vigorous treatment.

Dr. Waterman's associates are Drs. Sheldon E. Domm, William K. Rogers and Arthur J. Pollard at Fort Sanders Presbyterian Hospital, Knoxville.

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METEOROLOGY

## Energy of 4,500,000 A-Bombs Blows North

➤ ENERGY EQUAL to 4,500,000 exploding atom bombs a day pours into the air over polar regions from tropical areas around the world.

This energy transport across the 40-degree latitude belt is required to maintain the average temperature difference between the tropics and poles, Dr. Harry Wexler, chief of the Weather Bureau's scientific services division, told the Washington Academy of Sciences meeting in Washington.

An almost infinite number of eddies and whirls, some covering areas as large as the United States, others quite small, carry the energy northward.

To learn more about this energy transport, scientists plan to set up three pole-to-pole networks of stations to make meteorological recordings during the International Geophysical Year, Dr. Wexler said.

The IGY, scheduled for 1957-58, is a world-wide probe of the earth, its seas and airs in which 40 nations will cooperate. Scientists have dubbed it "Geophysics-for-Peace" program. (See SNL, Jan. 15, p. 42.)

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## • RADIO

**Saturday, June 11, 1955, 5:00-5:15 p.m. EDT**

**"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.**

**Walter A. Grant, vice-president in charge of central engineering staff, Carrier Corp., Syracuse, N. Y., will discuss "Air Conditioning."**

GENERAL SCIENCE

## National Plumbing Code Is Established

➤ AN AUTHORITATIVE code of modern plumbing standards for voluntary adoption by local areas has been approved.

Described as the country's first true national plumbing standard, the thick volume took over 20 years to develop. It was designed to coordinate the efforts of manufacturers, architects, designers and lawmakers.

The American Standards Association and the American Society of Mechanical Engineers pointed out that the code would fill a "long-felt need" for a single voluntary national standard.

Along with the American Public Health Association, a co-sponsor of the project, the U. S. Department of Commerce and six other groups helped develop the code.

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ELECTRONICS

## Better TV Signals From Slotted Pipe Antenna

➤ BETTER TV reception may result from development of a new type of broadcast antenna that looks like a length of pipe with thin slots cut into it.

Known as a "traveling wave" antenna because of the traveling electrical wave in the interior of the device, it is simple in design and construction. It emits a circular wave that has no gaps. Its developers are R. Wayne Masters and Conrad J. Rauch of Ohio State University.

The antenna may find use in color television broadcasting. The design had been largely cast aside because the beam had a tendency to wobble. This difficulty was overcome in the new antenna.

The research was done at Ohio State's Antenna Laboratory under a contract between the Ohio State University Research Foundation and the RCA Victor Division of the Radio Corporation of America.

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MEDICINE

# TB Prophylactic Drug

**Daily doses of isoniazid may prevent tuberculosis. Treatment with the drug, already used to fight the disease, protected guinea pigs from TB infection in laboratory tests.**

➤ HOPE OF preventing tuberculosis by daily prophylactic doses of the drug isoniazid, is now seen as a result of studies by Dr. Carroll E. Palmer and Mrs. Shirley Ferebee of the Public Health Service.

Isoniazid is already widely and effectively used in treatment of tuberculosis. Its possible preventive role was hinted when doctors found that it would stop tuberculosis infection in children from getting worse and spreading to the brain, to cause tuberculous meningitis.

At the Milwaukee meeting of the National Tuberculosis Association, the Public Health Service scientists reported that they had completely prevented tuberculosis in guinea pigs by isoniazid treatment.

The pigs were given isoniazid in their daily drinking water. After four and a half weeks of this, they were inoculated with heavy doses of virulent tuberculosis germs. Isoniazid was continued for another ten weeks.

The guinea pigs were completely protected from this heavy infection by the isoniazid. Only seven percent of untreated animals given this big dose of TB germs survived 10 weeks, but among those treated with the smallest dose of isoniazid, 36% survived this period. Those getting larger doses not only survived but, when the drug was stopped after 10 weeks, the animals were still completely protected six months later.

During the course of treatment and infection, the animals got as much immunity to tuberculosis as comes from B.C.G. vaccine, Dr. Palmer said.

Nurses, medical students and doctors, particularly those in tuberculosis sanatoria, are likely to be the first humans to get prophylactic doses of isoniazid. They are constantly exposed to the germs and many of them come down with the disease as a result. Taking small doses of the drug every day while they are working with TB patients might protect them.

Specific plans for this have not yet been made, but Dr. Palmer told SCIENCE SERVICE the results of the guinea pig studies "look so good" that he and his associates are going to see what program can be developed.

The questions of dosage and how long and how regularly to give the drug must yet be worked out.

Protection from daily doses of isoniazid might also be given members of a family when one member develops tuberculosis. It might be particularly helpful when the TB patient is home temporarily from the sanatorium. During these visits the rest of the family might be protected by taking isoniazid every day.

Some patients now are allowed to stay at home while under treatment with isoniazid. It seems likely that this home care might be extended to more, if prophylactic doses of isoniazid could be used to protect the rest of the family.

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MEDICINE

## Advise Removal of "Balloons" on Lungs

➤ WHEN A patient gets "balloons" on the surface of the lungs, the balloons should be removed, Drs. C. A. Burnett and C. J. Stringer of Ingraham Chest Hospital, Lansing, Mich., advised at the meeting of the National Tuberculosis Association in Milwaukee.

The balloons are air-filled cysts, blebs or bullae. They have frequently been reported in connection with certain chest diseases, particularly emphysema which is characterized by distention of the air sacs of the lungs.

The balloons can seriously interfere with heart and lung efficiency and may cause the air sacs of the lung to become compressed. This can pave the way for infection.

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*COLOR TV PICKUP—Four light-sensitive tubes in the "bucket" of the new color TV system pick up the flying light spot from the scanner.*

ELECTRONICS

# Color TV Without Camera

➤ A NEW system to telecast live color programs without a TV camera was shown for the first time.

Developed by Allen B. Du Mont Laboratories, Inc., Clifton, N. J., the system should allow small TV stations to broadcast their own live color shows economically.

The reverse of conventional color TV pickup, the new system uses a scanner that flashes a tiny, flying spot of light over the stage. The conventional camera is a light-receiving device.

The system was demonstrated at the meeting of the National Association of Radio and Television Broadcasters in Washington.

As the spot of light skips rapidly back and forth over the stage, covering the scene line-by-line, "buckets" stationed around the studio register the reflection. The buckets contain two red, one blue and one green light-sensitive multiplier phototubes. These separate the light into its fundamental colors for TV transmission.

Thus, as the beam hits the green dress of a performer, the reflection is picked up by the green-sensitive multiplier phototube which transforms the light to an electrical signal. When the impulse is sent out and picked up by your color receiver, it will reproduce a green dot on the TV screen.

Dot-by-dot and line-by-line, the system builds up the picture. But it is done so fast that to the eye it seems a smooth-flowing picture.

Different angles are obtained by moving the scanner, which on the surface looks and is operated like a TV camera.

A quick-flashing "sync-lite," similar to that used by photographers, alternates with the light spot from the scanner in quick succession. The room therefore seems light. But to the multiplier phototubes, which are made sensitive only between flashes, the room is dark.

A small crew can run the "Vitascan" setup, as it is called. Many stations already have the scanner, which contains a flying-spot cathode-ray tube, for use in televising black-and-white movies.

The system is ready for production.

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ARCHAEOLOGY

# Shrine For Bible Scrolls

➤ AN ANCIENT and unique manuscript dating back to shortly after the birth of Christ and telling the story of Noah's birth will be housed in a research shrine to be built in Jerusalem.

Although it changed ownership in Washington, the scroll is still in Jerusalem, tightly rolled as it has been for thousands of years. It is now being treated so that it can be unrolled without damage, but no one yet knows what is written in it.

The ancient scroll is one of four, found by a Bedouin shepherd boy in a cave near the northern end of the Dead Sea, presented to the State of Israel as a gift from an American industrialist, D. Samuel Gottesman, who purchased the scrolls when they were brought to New York for sale.

Perhaps most important of the four scrolls, said Prof. William F. Albright, Johns Hopkins University archaeologist, is the one still under treatment in Jerusalem, because it is the only surviving well preserved book in Jewish Aramaic that was composed during the 400-year period between 250 B.C. and the second century A.D. It is presumed to have been written by Lemach, father of Noah, and describes Noah's "miraculous birth."

From the glimpses Prof. Albright was able to get of the manuscript in its tightly rolled state, it is in excellent condition and a creamy white in color. It was apparently written with a well seasoned reed pen cut slanted at the end and split to allow the ink to flow. The book was originally composed in the first or second century B.C. and this copy dates from the first century A.D.

Of equal importance to the Lemach scroll, Prof. Albright said, is another in the collection, the earliest known manuscript of the book of Isaiah.

A third scroll is called "The Manual of Discipline." It contains the rules of a religious order believed to be the Jewish sect known as the Essenes. Another of the scrolls contains a commentary on the Old Testament Book of Habakkuk.

The Israel government plans to build a "Shrine of the Book" to house these ancient scrolls and others relating to the Bible that may be acquired later. The shrine will be located on the campus of the Hebrew University in Jerusalem.

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MEDICINE

# Announce New Anesthetic

➤ ANNOUNCEMENT OF a new anesthetic drug related chemically to anti-arthritis cortisone was made simultaneously in New York and Geneva, Switzerland.

The new anesthetic is hydroxydione sodium, tradenamed Viadril by its manufacturers, Chas. Pfizer and Co., Inc., of Brooklyn, N. Y.

Good results with it in more than 130 operations involving 20 surgical procedures were reported by Drs. Frank J. Murphy, Neri P. Guadagni and Francis L. De Bon of the University of California School of Medicine, San Francisco, at the International College of Surgeons meeting in Geneva.

The California doctors consider it a good "basal" anesthetic, meaning that it is not a very potent anesthetic but gives good results when used with nitrous oxide, the so-called laughing gas, and oxygen. It is given by injection into the vein, but must be injected slowly in a mixture of sugar in water to avoid irritation of the vein. It takes about five minutes to make the injection and another five minutes to take effect enough to move the patient and start the operation. Patients go to sleep easily and awaken easily when it is used. If ether or other anesthetics are given with it, less of them are needed.

Viadril is a steroid chemical, as are cholesterol and cortisone and other hormones. Viadril, however, does not have any hormone effect. It was developed and tested on laboratory animals by Pfizer scientists Drs. Gerald D. Laubach, S. Y. P'an and H. W. Rudel. First suggestion that a steroid chemical could have anesthetic effects came from the Canadian scientist, Dr. Hans Selye.

First use of it on a human was by Dr. Gilbert S. Gordan Jr. of the University of California who used it for a brain operation.

The steroid anesthetic is a true anesthetic, not a hypnotic, Dr. Murphy stressed. He thinks it should therefore not be compared with pentothal sodium, the barbiturate sleeping medicine widely used to put patients to sleep for surgical operations.

Because it is an entirely new kind of anesthetic chemical, scientists at the Pfizer firm and the California doctors think other steroid anesthetics may be made.

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MEDICINE

## "Tombstones" in Lungs May Start New Disease

➤ SERIOUS LUNG disease, sometimes appearing like cancer, may start from the "tombstones" of former conquered disease in the lungs, Drs. Laurence K. Groves and Donald B. Effler of the Cleveland Clinic Foundation, Cleveland, Ohio, at the meeting of the National Tuberculosis Association in Milwaukee.

The tombstones are lymph nodes that have calcified, or become stony. They apparently are the residue of healed tuberculosis, histoplasmosis or other disease. Whatever the cause, they form a mechanical basis for a new disease process, known as bronchiolithiasis.

Symptoms of bronchiolithiasis include a harassing cough, sometimes accompanied by the spitting up of blood and, in more serious cases, by wheezing respirations when eroding nodes cause bronchial obstruction. A mild case may be treated by relieving the cough, but surgery may be necessary to remove obstruction in severe cases. Dr. Groves emphasized, however, that the surgical procedure is "extremely difficult and hazardous."

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MEDICINE

## Auto Mechanic's Tool Made to Study Heart

➤ AN INSTRUMENT developed to measure roughness of highly machined auto parts has been converted to help doctors study the human heart.

The medical instrument is an Electro Stethograph which gives doctors a high fidelity record of heart sounds so faint they cannot be heard by the human ear even aided by a physician's stethoscope.

The machine shop tool it was made from is the Surfagage, developed by General Motors Research Laboratories. Adaptation of the Surfagage's supersensitive pickup to the doctor's stethoscope was suggested by Charles F. Kettering, GM research consultant, when Dr. Dale Groom at the Medical College of South Carolina, Charleston, told him of technical difficulties he was having in experimenting with various sounding devices.

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MEDICINE

## Flu and Chemical Cause Lung Growth in Mice

➤ INFLUENZA VIRUSES combined with a chemical cause an extensive growth in the lungs of mice, although the chemical alone produces only a tiny tumor.

Research by Drs. John Adams and David Imagawa, of the University of California at Los Angeles, shows that the chemical, urethan, alone produces a few tiny tumors in the lungs of mice when injected into these animals. And influenza viruses alone cause some inflammation. But the combination of the two produced large masses of cells which are far more extensive than can be produced by either alone.

"Like most other animal experiments, these results do not tell us what happens in human beings," the researchers said. "They merely suggest lines for further research. Chemicals which produce cancer in animals are suspected of being related to human cancer. Several respiratory diseases are known to cause extensive cellular changes and the formation of giant cells in human lungs."

The question is whether these cells are seeds of cancer that may be germinated by repeated irritation from inhaled chemicals. Or is lung cancer caused by a combination of chemical irritation and repeated jolting of lung tissue by the many respiratory ailments we have during life?

These are some of the questions the investigators hope to answer through such studies.

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Because of their greater penetrating power and lower scattering, high energy *X-rays* from betatrons and synchrotrons produce sharper images than lower energy X-rays, allowing detection of more minute flaws in metal parts.

*HI-FI HEARTBEATS — Electro Stethograph, which records faint heart sounds with high fidelity, was developed from an automotive tool. Doctors show how the device works.*

AERONAUTICS

# Strange New Planes

➤ NOW THAT man can fly like a bird in his planes, he is trying to accomplish something else any bird can do—leap into the air without long runways.

Aircraft designers are therefore abandoning classical bird-like shapes for their new planes. They are thinking in terms of flying barrels, flying saucers, flying platforms, flying Venetian blinds and more versatile helicopters.

The purpose of such designs is to permit vertical or steep-angle take-off, yet maintain fast forward flight.

France is reportedly working feverishly on its revolutionary scheme, the secret barrel-winged coleopter. Flying models are believed to have been tested, but whether or not they were piloted is not known. The tube-like wing surrounds the fuselage like a barrel.

The A. V. Roe Co. in Canada has experimented with a "flying saucer," designed to take off vertically. Jet thrust blowing downward around the edges of the disc-like craft causes suction on the upper surface, generating the lift. Adjustable thrust vanes deflect the jets for horizontal flight.

Rolls-Royce, in Britain, has designed a model dubbed the "flying bedstead." It is thrust into the air vertically by two jet nozzles pointed downward in the front and rear.

The United States has her share of new sharp-angle take-off planes, design of which has been prodded by the military because of the strategic advantage of operation from smaller airports.

Two models of the convertiplane, a cross between helicopters and conventional planes, have been unveiled. One, the McDonnell XV-1, has completed its first successful conversion from vertical to fast forward flight. The other, the Bell XV-3, is in initial tests.

The flying platform, with its hidden lift propellers, created a sensation recently with its first successful flight. It is controlled by the balance responses of the pilot, who leans in the direction he wants to go.

The Navy's XFV-1 and XFY-1, the "Pogo" planes, are another successful attempt for quick take-off. They are designed to rise and land on their tails.

A design under serious study in many countries is a channel-winged plane. A U-shaped scoop in each wing is built behind the propellers to provide extra lift.

The National Advisory Committee for Aeronautics, a U. S. Government research group, has tested a configuration with a series of retractable flaps mounted like a Venetian blind on the wing to deflect the propeller backwash downward. This provides extra lift on take-off.

One or more of these advanced designs may become the major plane type of the future.

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GEOPHYSICS

# Russia Studies Arctic

➤ THE FLOOR of the central part of the Arctic Ocean resembles that of the Mediterranean Sea, Russian explorers claim. This and other findings, made during the extensive and much publicized Red polar expeditions of 1954, are reported in *Voks* (Jan.-Feb.) a Russian cultural magazine.

In their ocean bottom surveys, the Russians found that the central part of the Arctic Ocean is not a single depression, but its pattern is complicated, like that of the Mediterranean.

They also state that the central Arctic ice is not a solid mass of very old pack-ice, but consists of blocks and fields of ice of different thickness and age. V. F. Burkhanov, head of the Central Northern Sea Route Administration, reported that when the ice moves from the south to the north, it usually increases in thickness.

The Russians established two research stations on floating ice islands last year, known as North Pole-3 and North Pole-4.

They now report that the island ice appears to thaw and accumulate both at the top and the bottom, in different amounts under different conditions. As a rule, the ice thaws on the top during the summer, and accumulates at the bottom during the winter. In this way, it is gradually renewed.

This finding tends to support a hypothesis suggested by Dr. Frank Debenham, emeritus professor of geography at Cambridge University, England, who first presented the upside down ice island formation theory in November 1954. The United States has also manned floating ice islands in the northern regions.

The 1954 explorers also discovered the Arctic to be rich in animal and plant life, "even at the North Pole itself." One group reported seeing "ruby-red ice-floes," that appeared to be covered with a countless number of "tiny vegetable organisms of a red color."

The Russians, who have long been interested in the polar regions, are still maintaining their floating ice island bases and continuing to explore the vast northern reaches. Along with supplying weather reports for the whole of the Soviet Union, the Reds claim that their explorations have extended the period of navigation over the Northern Sea Route and that "more and more vessels sail along this great route every year."

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ATOMIC PHYSICS

# Reduce A-Power Danger

➤ A DESIGN to reduce dangers from nuclear power plant explosions by confining radioactive by-products to the premises has been put forth by a Dayton, Ohio, engineer. The plan might "save the major portion of the plant from contamination."

Charles C. Littell Jr. proposes that reactors be built of massive construction as to tensile strength and mass of the walls and top, the floor of the building housing the reactor being of similar construction.

"If the whole were hermetically sealed, with the floor of the reactor relatively weak, blow-out and gravity would express the contents downward," he wrote in the journal, *Science* (May 20).

Underneath, according to Mr. Littell's plans, a large water trap would receive the debris and gas, the walls of the building extending well down into the reservoir, with a moat of sufficient dimensions around the building to accommodate the water displaced from the reservoir.

Air-filled space above the water in the reservoir would act as a pneumatic cushion during the initial surge, permitting displacement of the water mass without undue shock.

"Dimensions," he said, "should be such that all gases would be confined to the inner chamber."

Excess volume and pressure would reduce the reservoir level to the point where it would pass under the intervening wall and up through the deep water in the moat. Condensation by cooling and by going into solution under conditions of turbulence and pressure from the explosion would cut down the initial volume of gas produced.

"Confining the radioactive materials to the underground chamber, with only flat surfaces to be decontaminated," Mr. Littell cluded, "would greatly facilitate reconditioning."

The floor and tunnel across the moat of heavy construction would insure maximum protection for personnel and would permit early reactivation of the reactor after an explosion.

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PSYCHIATRY

## Inner Life Problems Cause "Dry Drunk"

➤ PROBLEMS OF the "inner life" are the most potent cause of the "dry drunk," Drs. James A. Flaherty, H. Thomas McGuire and Robert L. Gatski of the Governor Bacon Health Center, Delaware City, Del., reported at the meeting of the American Psychiatric Association in Atlantic City.

The "dry drunk," they explained, is a term used by alcoholics to describe an emotional state they must cope with while keeping sober over an extended period.

Depression, impatience, intolerance, irritability, nervousness, occasional confusion and an irrational desire to resume drinking are symptoms of this state.

During a dry drunk, the former alcoholic tries to avoid people and is sarcastic and critical toward those who cannot be avoided.

The dry drunk may last from an hour to four months. The depression may be so great that suicide is planned. Return to drinking almost always follows a dry drunk.

Effective means of fighting the dry drunk are to attend meetings of Alcoholics Anonymous and to consult members of this organization outside of meetings, the psychiatrists advise.

Spouses and other members of the family, friends not in A.A. and non-understanding persons are least helpful during a dry drunk.

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MEDICINE

## Calming Drugs Help In Severe Itch Cases

➤ WHEN THE patient is frantic because of uncontrollable itching, two relatively new calming drugs help, Drs. Theodore Cornbleet and Sidney Barsky of the University of Illinois College of Medicine declared at the meeting of the Illinois State Medical Society in Chicago.

The drugs are reserpine and chlorpromazine. Both have been used effectively to treat high blood pressure and mental sickness.

Because they calm the patient and make it easier for him to bear the itching, the dermatologist, or skin specialist, can focus attention on treating the skin trouble itself.

"These tranquilizing drugs," Dr. Cornbleet said, "can be to the dermatologist what the anesthetist is to the surgeon."

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MEDICINE

## Cut Sac Away From Heart in TB Cases

➤ AN OPERATION to cut away the sac that surrounds the heart was reported by Dr. Herbert C. Maier, Lenox Hill Hospital, and Dr. Howard D. Sirak, Bellevue Hospital, both in New York, at the meeting of the National Tuberculosis Association in Milwaukee.

The operation is done in the relatively rare case when tuberculosis attacks this sac, called the pericardium. In such cases the sac may rapidly thicken and this interferes with heart function. Drug treatment of the tuberculosis may not be enough to overcome the condition.

When anti-TB drugs are given, however, the operation may be done with much more success than previously.

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Three out of four *traffic accidents* occur in clear weather on dry roads.

*AIR TRAFFIC BEAM—Slicing into the sky near busy La Guardia Airport, this 300,000,000 candlepower beam of light guides departing planes down Flushing Meadow and away from residential areas on either side, thereby reducing noise to nearby communities.*

MEDICINE

# Fight Disease With Milk

➤ GRANDMA USED to "starve a fever" but the modern way is to feed it, or rather the patient, especially with milk, vitamins and body-building protein chemicals.

Details of the scientific studies back of this new idea for fighting germ-caused diseases were presented at a New York Academy of Sciences meeting in New York.

Special consideration should be given to milk as a source of virus-checking mucoprotein, Dr. Joachim Kuhnau of the Physiological Chemical Institute at the University of Hamburg, Germany, declared.

Such a chemical is needed, he explained, to stop the specific enzyme reactions by which bacteria and viruses are linked to the membranes, or outer envelope, of body cells.

The beginning of a virus infection, he said, is related to this linking of the virus to the cell membrane. It is brought about by a virus enzyme and is associated with changes in the protein of the cell membrane. These changes destroy the membrane and so make it easier for the virus to get inside the cell for its attack.

Virus and other germ infections lead to a speed-up of some body chemical processes. This results in protein breakdown and a shift in fluid from cells to the spaces in-between and a loss of fluid from various organs of the body. Treatment, Dr. Kuhnau stressed, must therefore include giving protein and protein-building amino acids, potassium and fluids.

Vitamin A is important for fighting infections, particularly in connection with kidney functions, Dr. Benjamin M. Kagan of Michael Reese Hospital, Chicago, declared. He reported animal studies showing that during infection the body draws heavily on its store of this vitamin.

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AGRICULTURE

## Mint Gum-Flavor Saved, Chemical Kills Disease

➤ THE TELL-TALE flavors of mint chewing gums can be saved and a mint plant disease eliminated with the development of a new fungicide.

Mint rust, a fungus disease that has seriously cut the mint plant yield in northwestern United States, now can be eliminated. Previous attempts at eliminating the rust resulted in protests from gum makers, who found that the chemicals used discolored or changed the flavor of the mint oils.

Marketed under the trade name, Phygon Mint Dust, tests conducted in Oregon indicate that the new fungicide kills the rust after four to six applications of 30 to 40 pounds per acre during the season.

The fungus affects the plants by sapping their strength and cutting the yields. It winters in the soil and in the spring forms a yellow canker on the stem.

Science News Letter, June 4, 1955

AERONAUTICS

## Searchlight to Direct La Guardia Planes

➤ A "TRAFFIC light in the sky" has been built at La Guardia Airport, New York, to direct departing planes away from residential areas.

It is a powerful searchlight that beams a column of light from a point about three miles from the airport. Planes taking off will fly toward the beam, avoiding the heavily populated areas and reducing noise nuisance.

The 2,500-watt short-arc mercury lamp, operated by the Civil Aeronautics Administration and developed by Westinghouse Electric Corporation, is tilted at a 30-degree angle from the vertical toward the airfield. It casts a shaft of light equal in intensity to 10,000 automobile headlights.

The searchlight was formerly used by the Army in connection with anti-aircraft emplacements.

Science News Letter, June 4, 1955

ELECTRONICS

## Expect Four-Mile Range For New Loudspeaker

➤ "SAM'S" SHOUTS will be heard four miles away. That is the hope of Stanford Research Institute scientists at Menlo Park, Calif., who are now testing their mighty new loudspeaker.

Its cries will drown out conventional loudspeakers which only carry about a half mile.

Short for "Stanford Airstream Modulator," SAM has inherent advantages over radio and wire communications in civil defense, psychological warfare and military uses. It cannot be jammed. Persons in the enemy lines might not have electronic equipment to monitor broadcasts, but they could hardly ignore the bellowing roars of SAM.

A departure from conventional loudspeaker design, SAM is similar to man in more than name, the researchers point out. It has structures analogous to the human speech organs: a high pressure air compressor acts as its lungs, a quick-acting valve as its vocal chords, and an acoustic horn as its mouth.

Controlled emission of a stream of air from the compressor gives SAM his extraordinarily loud voice. The quick surges of high pressure air create the powerful sound waves. In an ordinary loudspeaker, a cone-shaped diaphragm is vibrated to set up the sound waves; no compressed air is needed.

To test SAM without setting the whole countryside in an uproar, the scientists had to build a 30-foot-long muffler, lined with two inches of glass fiber and surrounded by a box filled with 12 tons of sand.

Science News Letter, June 4, 1955

Motor car pistons are plated with *tin*, which serves as a lubricant during the break-in period.

TECHNOLOGY

## Streamlining Can Cut Truck Fuel Bill 30%

➤ RADICAL STREAMLINING of conventional truck-trailers can cut fuel bills 30%, wind tunnel experiments at the University of Maryland have demonstrated.

Working with 50-mile-an-hour winds and one-sixth scale, piece-together wooden models, engineers found that the gap between the cab and the truck alone accounted for one-quarter of the air resistance. Prof. A. Wiley Sherwood, wind tunnel manager, predicted the truck of the future would probably employ a sliding panel connection between the two units.

No vehicles in service now have this space covered.

Another 20% of the air resistance can be eliminated by "skirting" the vehicle, or covering the top half of the wheels with an outside sheet of metal.

If the gap between the cab and the trailer is not filled in, rounding the corners and edge surfaces would contribute large savings over "boxy" designs.

The ultimate in streamlining would employ a "beaver tail" rear design which would reduce wind resistance another 12%. This would be impractical on actual trailers since it would cut down on the trailer's storage space.

More than 7,000 cab and trailer combinations were tested in the university's subsonic wind tunnel. The experiments were the first of their kind ever made on truck-trailers, and were conducted by Paul Jung and other engineers from Trailmobile in a research project for the American Trucking Associations Foundation.

Science News Letter, June 4, 1955

VETERINARY MEDICINE

## Hormone and Antibiotic Gives More, Better Beef

See Front Cover

➤ MORE AND better beef is the result of experiments by a team of nutritionists at the Agricultural Research and Development Farm of Chas. Pfizer & Company, Inc. The announcement was made before the farm's third annual research conference in Terre Haute, Ind.

The scientists used a supplement containing recommended levels of stilbestrol plus the antibiotic terromycin. Stilbestrol, a synthetic with female hormone activity, has been widely used during the past year as a cattle growth-promoter.

Feeding cattle this supplement on a commercial feed lot where animals are fattened by 400 pounds before marketing would save 268 pounds of feed per steer over cattle fed stilbestrol alone, and 916 pounds of feed saved per steer over cattle which received neither supplement, the scientists said.

Cattle receiving the terramycin-stilbestrol combination returned an average of $3.53 more per head when put on sale at the stockyards.

The experiment involved a total of 192 Hereford steers like the one shown on the cover of this week's SCIENCE NEWS LETTER, fed over a 100- to 130-day fattening period. One of the trials was conducted on a hay-grain ration, the other on a high carbohydrate corn and cob ration.

Steers were divided into three groups of 64 each, in both trials, the scientists said. A control group received no supplement. The second received a dose of stilbestrol daily. The third received eight times as much stilbestrol plus terramycin daily.

Of the carcasses of the steers in the third group, 52% graded choice, 48% good, compared to 48% graded choice, 48% good, and four percent commercial, in the control group that got no supplement, and 41% graded choice, 50% good, and nine percent commercial in the second group, the scientists reported.

Cattle fed the new feed additive gained weight at the rate of 2.79 pounds per day as compared to 2.18 pounds per day in the control group and 2.46 pounds per day in the group fed stilbestrol alone.

Science News Letter, June 4, 1955

GENERAL SCIENCE

## Accident Reports Can Save Lives—Maybe Yours

➤ WHEN YOU fill out an accident report, do you chafe at the many questions and red tape involved?

Well, do not.

The time and trouble involved may save lives—perhaps your own.

Research in the Institute of Transportation and Traffic Engineering at the University of California at Los Angeles has shown how your report, combined with thousands like it, can point the way to reduction of crashes and resultant injuries when carefully analyzed by traffic experts with the help of electronic brains.

The study was supported by the U. S. Air Force. Lessons learned are applicable to all, in government or privately owned vehicles.

Conducted by J. H. Mathewson, Robert Brenner, Slade Hulbert and Derwyn Severy, the research yielded several significant results:

1. New methods have been developed for digesting large numbers of accident reports into readily interpretable facts. These include psychological and other personal characteristics of accident drivers and injury patterns of crash survivors as well as fatalities.

2. It was found that accident drivers, as a group, had fewer years of schooling than the average in the Air Force.

3. Drivers and passengers do not suffer the same types of injuries. Dislocations and sprains are more in evidence in passenger injuries. Fractures occur with greater frequency among drivers.

Science News Letter, June 4, 1955

# IN SCIEN

PUBLIC HEALTH

## Find Smog "Fingerprint" In City Atmospheres

➤ CITIES HAVE tell-tale smog "fingerprints" in their atmospheres, a study of the air from 31 metropolitan areas in the United States, Alaska and England showed.

New Orleans has a "coffee" atmosphere. The gases separated from that city's air "shows all the identifying absorption characteristics of caffeine," three U. S. Public Health Service scientists said.

The infrared "fingerprints" of different smogs probably reflect differences in industrial activity, waste incineration practices or products of other human efforts.

Careful study of the absorption pattern, obtained from a spectrograph of particles in the air, may help spot particular sources of smog, the scientists said at a meeting of the Air Pollution Control Association in Detroit.

About 90 high volume samplers are being operated now by voluntary personnel of local and state agencies. About 2,000 samples from such devices were correlated in the report presented by Drs. Leslie A. Chambers, Elbert C. Tabor and Milton J. Foter.

Each sample consisted of the total particulate matter removed from 2,000 cubic meters of air during a 24-hour period. Organic substances were routinely extracted with acetone and evaporated to constant weight. Use of fired filters made possible estimation of organic soluble substances and proteins, as well as radioactivity and a variety of inorganic ions.

Science News Letter, June 4, 1955

ENTOMOLOGY

## Collection of Ants Given to Smithsonian

➤ A UNIQUE collection of more than 117,000 specimens of ants has been given to the Smithsonian Institution in Washington by Dr. William M. Mann, director of the National Zoological Park.

The gift makes the Smithsonian's ant collection one of the most complete in the world, increasing its number of type specimens from 1,200 to 1,900. There are approximately 8,000 kinds of ants in the world, but type specimens on which the original scientific description of a species is based are widely scattered.

Dr. Mann has personally collected ants all over the world. His most startling discovery, he reported, was of a living ant that was a nearly perfect replica of the ants of the tree-fern forests of 300,000,000 years ago.

Science News Letter, June 4, 1955

# CE FIELDS

PUBLIC HEALTH

## Yeast Chemical Can Aid Radiation Survival

➤ A CHEMICAL from yeast can change the body's ability to survive or succumb to deadly doses of radiation and also to handle invading disease germs, scientists at Western Reserve University, Cleveland, Ohio, have discovered.

The yeast chemical is called zymosan. It is the insoluble cell-wall residue from yeast. When injected into mice and rats, it increases or decreases the amount of properdin in their blood.

Properdin is a protein which seems to play an important part in giving natural immunity to germ and virus diseases and protection against fatal doses of irradiation. Its discovery and effects were announced last fall by Dr. Louis Pillemer and associates of Western Reserve (see SNL, Sept. 4, 1954, p. 156).

In *Science* (May 20) Dr. Pillemer and Dr. Oscar A. Ross report their new finding of the action of zymosan on the properdin in the blood of laboratory animals.

Within one or two hours after it is injected, zymosan causes a decrease in the amount of properdin in the blood. This is followed after two days to two weeks by a marked increase in properdin to 200% to 300% above the normal level.

Properdin can be obtained in good yield from cattle blood. Bovine properdin, the scientists previously reported, protected mice against 800 roentgens of total body irradiation and the mice gained weight and remained healthy for at least three months after the irradiation.

Zymosan injected before or after irradiation decreases or increases the deadly effects, depending on the time it is given, the dose, and whether injected into the bloodstream or elsewhere in the body.

Science News Letter, June 4, 1955

PHYSICS

## Atomic Space Looks Like Swiss Cheese

➤ ATOMIC SPACE looks like "Swiss cheese," to a Purdue University physicist. The "holes" are where the masses of atoms are located, the "cheese" is the space between.

The "Swiss-cheese" model of the atomic world was devised by Dr. Frederik J. Belinfante in an effort to reconcile Einstein's curved universe with the quantum laws governing atomic particles.

Einstein's general theory of relativity holds that space, like the earth's surface, is curved wherever there is mass, the amount of curvature increasing with greater mass. Over a small section of such space, the three dimensions of length, width and breadth give sufficiently accurate measurements. Over a longer distance, the curvature must be taken into account.

A familiar example of this is the jog that straight flat roads in the Midwest suddenly take after many miles. Although property rights are sometimes involved, the jog is usually put there to make up for the earth's curvature.

The "jog" of space near atomic masses is sharper. Close to the point at which an atomic particle's mass is concentrated, space suddenly becomes infinitely curved in Dr. Belinfante's model.

The smooth water surface that suddenly breaks into a whirlpool gives a rough, much enlarged picture of what Dr. Belinfante suggests takes place in atomic space.

"If a picture of space is made" on a very small scale, he stated in the *Physical Review* (May 15), "then space has holes, where masses are located." This is the "Swiss-cheese" model of space.

Dr. Belinfante believes that his model may be helpful in visualizing atomic space, in calculations and "as a basis for a simple quantum theory of fields."

Science News Letter, June 4, 1955

GENERAL SCIENCE

## New Tonguetwister Made—Parsnip Chips

➤ ADDICTED POTATO chip eaters will soon be able to vary their snack diet with carrot chips, beet chips and parsnip chips. Other tidbit fanciers will be able to munch on whole pea and lima bean "nuggets."

These newly developed snack foods are all prepared by deep-fat frying. The beets and carrots are sliced 1/16 inch thick and the parsnips, 1/32 inch.

Created by scientists at the U. S. Department of Agriculture's eastern utilization research branch in Wyndmoor, Pa., all are described as high in carbohydrate and fat. Carrot chips are high in provitamin A and the peas and beans in protein.

Each chip retains its own characteristic taste. The nuggets have a nutlike flavor.

"Besides their use as snack items," the Wyndmoor scientists report, "the lima-bean and pea nuggets can be ground into soup powders that reconstitute quickly in hot water." They can also be pressed into quick energy bars for emergency military rations.

Both the chips and nuggets keep from six months to a year in storage at room temperature if fried in oil of high stability, such as coconut oil. Peanut, corn or cottonseed oil can also be used.

The new foods are seen as offering potato chip manufacturers an additional line of foods, as well as a new market for the vegetables.

"Although no commercial production has yet been undertaken," the agricultural researchers state, "major food processors are actively interested in the new products."

Science News Letter, June 4, 1955

ANTHROPOLOGY

## Men Wear the Veils in Nomadic Sahara Tribe

➤ EVER HEAR of a tribe in which the men proudly wear veils?

Tall, aristocratic and fearless, these people are the Tuaregs and were visited recently by Dr. Benjamin Thomas, University of California at Los Angeles geographer, while studying trade routes in Africa.

The Tuaregs once ruled desert commerce with an iron hand before their power was broken by the French.

Called the "People of the Veil," the Tuaregs are a nomadic people who live in the central part of the Sahara desert. They retain a hereditary caste system and any labor except for managing herds or fighting is deemed unworthy by Tuaregs born to the noble class.

To Tuareg men, the veil is a symbol of masculinity and is worn from puberty. Tuareg women, unlike their Moslem sisters elsewhere in the Arab world, never wear the veil and have the same social freedoms as women in the Western world.

In their sojourns through the desert, Tuaregs still carry lance and sword. And on their arms are shields of antelope hide shaped like those once carried by Christian Crusaders. A favorite diversion is dueling armed with sword and shield.

Science News Letter, June 4, 1955

MEDICINE

## Cigarette Tar Chemical Causes Tumors on Plants

➤ DISCOVERY THAT a chemical in cigarette tar will cause so-called tumors in plants has been announced by horticulturists R. H. Roberts, B. Esther Struckmeyer and Sidney O. Fogelberg of the University of Wisconsin.

The tar was obtained from machine-smoked and naturally-smoked cigarettes.

The three research workers also reported that they can prevent the tar-extract effect on plants by adding a recently-discovered plant hormone, antiauxin, to the tar at the time of application. The antiauxin is a crystalline substance extracted from the leaves of plants which are in flower. They tested it successfully on plants treated with certain chemicals and hormones, including the 2,4-D weed killer, which produce tumorous tissue on plants.

The antiauxin has definitely shown its ability to inhibit or prevent the plant tumor formation that normally would result from applications of these materials, one of which is the tar extract.

It was while studying the antiauxin and its properties that the three scientists discovered a way to isolate the tar factor which also produces a tumorous growth on plants. Though this tar factor has not been chemically identified yet, it melts at a relatively low temperature and is very poorly soluble.

Science News Letter, June 4, 1955

MEDICINE

# Freezing To Live

**Because chilling the body lowers its demand for oxygen, surgeons are using refrigeration to save life and limb in bloodless operations.**

By JANE STAFFORD

➤ MORE AND more patients these days are getting cold treatment from doctors. Theirs is not a case of getting the cold shoulder. The treatment is really cold in the temperature sense. They are being almost frozen—to live.

Some of them are small children born with defective hearts that need "blue baby" and other kinds of operations to mend them. Others are grown-ups with tumors, called aneurysms, of blood vessels. Servicemen with leg and arm wounds will benefit from the new developments in cold treatment. For the future, there is hope that the experience of some patients in freezing to live will show how to save fliers forced down in icy seas or men on Arctic duty marooned in blizzards away from base.

The patients do not feel chilled. They are put gently to sleep before the cold is turned on. They do not awaken until they are warm again. While they are having their frosty nap, surgeons have time to perform intricate operations that are practically bloodless, even when the operations are done on veins and arteries and the heart itself.

## More Time

The time factor is the big gain from this cold treatment. When a surgeon cuts into a large blood vessel or the heart he must stop the blood flow temporarily. But blood carries oxygen. And body tissues cannot live long without oxygen. Some can take oxygen lack for longer periods than others. But for vital organs such as the brain, liver and kidneys, the crucial period is measured in minutes. The human brain dies if deprived of oxygen for more than four or five minutes. The liver is hopelessly damaged by about 20 minutes of oxygen lack. Kidneys will not return to functioning if blood is kept from them for 45 minutes.

One way of sparing tissues from suffocation is to reduce their demand for oxygen. Years ago anesthetists recognized, in a backhanded way, that reducing body temperature would reduce oxygen demand. What they recognized first was really the reverse of this. A patient brought to the operating room for an emergency appendix operation did poorly under the anesthetic if he was feverish. This was because the need for oxygen is increased seven percent for every degree Fahrenheit rise in body temperature. A patient with a temperature of 101.6 degrees Fahrenheit would need a 20% increase in oxygen. Such patients could not get by on the oxygen in the air of the room. So anesthetists faced with such patients would turn on the oxygen tank to give extra oxygen to the patient. Air-conditioning for operating rooms helped when it came along. So did ice packs and putting ether on the skin.

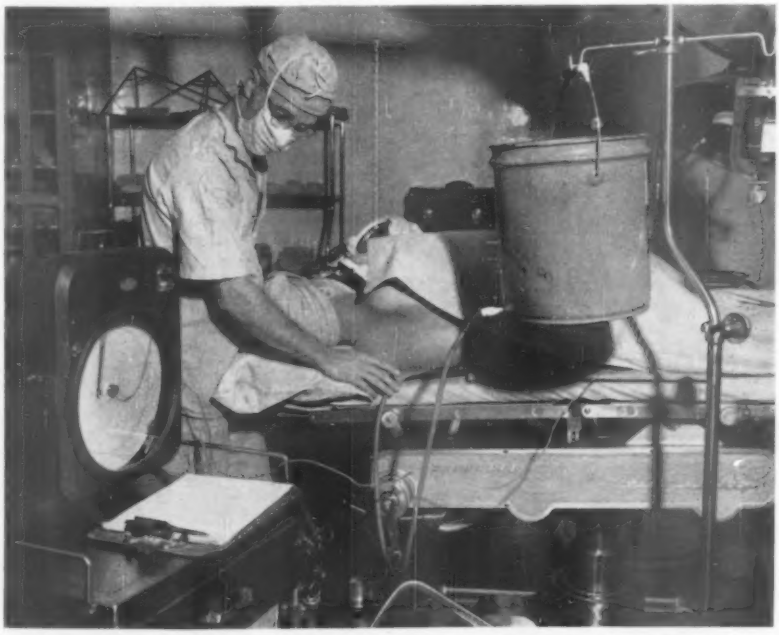
These measures helped feverish patients by reducing the body's demands for oxygen. Next step, though it was not taken immediately, was to reduce oxygen demand in patients with normal temperatures by dropping their temperatures below normal.

The idea was to make the patient something like the hibernating ground squirrel and ground hog settled for the long winter's nap. In true hibernators, the breathing and pulse almost stop and the temperature drops to a point very little above that of the animal's environment. The animal's body apparently has its oxygen needs reduced to a very low level and yet it can survive. Some Canadian scientists have been studying hibernating ground hogs in the hope of finding the secret of their survival with such low amounts of oxygen. Meanwhile they and doctors elsewhere have been deliberately chilling patients many degrees below normal body temperature of 98.6 degrees Fahrenheit.

The limit to which patients have been chilled has been about 75 degrees Fahrenheit. Below this, complex chemical changes occur which may become irreversible. Theoretically, if patients could safely be cooled to about 53 or 54 degrees Fahrenheit, their body tissues would make no demands for oxygen.

The 75-degree limit, however, has enabled many life-saving operations to be performed. One case was that of a young man with a blood vessel tumor of the aorta. This tumor, or aneurysm, was in the arch of the aorta and involved the main blood supply to the body. Each time the heart pumped, the balloon-like sac on the blood vessel wall was in danger of blowing out. Unless it could be removed and the blood vessel wall stitched together, the patient's life was in constant danger, since a blow-out of the sac would mean a swift and fatal hemorrhage.

To remove this patient's aneurysm required clamping the aorta shut between the heart and the aneurysm. This would



*PREPARING FOR FROSTY SLEEP—Many methods of chilling body have been developed. At Walter Reed Army Hospital in the Nation's Capital, Capt. Thomas G. Barila shows the over-sized cold water bottle or mattress he has developed as a simple, effective apparatus.*

stop all blood flow through the body except to the right arm and right half of the brain. The needed surgical repair could not be done in the four or five minutes that the aorta could be clamped shut at normal body temperatures. So the anesthetist chilled the patient, the surgeon performed the operation, the patient was warmed and 11 days later walked out of the hospital, a well man.

Equally dramatic was the case of a man past 70 years old with a bad heart who developed an aneurysm. He needed to have the aneurysm removed and a piece of blood vessel grafted to replace that cut out. The surgeons were not sure how long this would take. They feared that with ordinary methods interruption of blood supply to the lower part of the man's body might have so starved the tissues of oxygen that his kidneys might have gone bad or his legs might have become gangrenous and had to be removed. So they chilled him before operating. Today this 70-year-old with the bad heart is still alive and "running around."

### Methods Outlined

Refrigerating patients, inducing hypothermia (low temperature) doctors call it, can be done by many methods. At the Army's Walter Reed General Hospital in Washington, D. C., it is done by an "overgrown water bottle." This is simply a rubber mattress through which ice water can be circulated. The sleeping patient lies on the mattress and is cooled to the desired degree.

At the University of Colorado School of Medicine, Denver, the patient is cooled by being put in a tub full of ice water, warmed to normal by immersion in a tub of warm water.

European scientists run blood from an artery through a plastic tube packed in ice and back to a vein.

George Washington University scientists in Washington, D. C., run sterile cold salt water into the patient's chest, warm him up by running sterile warm salt water into the chest cavity. This is for patients who will have operations on the heart and whose chests will be opened anyway.

Doctors at Guy's Hospital in London suggest putting a small balloon into the patient's stomach through his throat, running ice water into it to cool the patient and hot water to warm him. The method succeeded in reducing high fever in a very sick baby and should, the doctors believe, be equally useful for patients having heart and great blood vessel operations.

Refrigerating human patients got its modern start in 1937 when Philadelphia doctors tried it for hopelessly sick cancer patients. The theory was that the low temperatures would slow the growth of the cancer cells. Studies of chick embryos had showed that the growth of young, embryonic and fast-growing cells was checked as temperatures were reduced. Patients were kept in "frozen sleep" at 75 degrees Fahrenheit for from 24 hours to eight days, with relief of pain and suffering.

During World War II refrigeration anesthesia was used for arm and leg wounds. The arm or leg was packed in ice and a tourniquet applied for two hours or so. After that, needed operation could be performed without further anesthetic.

"Frozen sleep" is, however, only semi-hibernation. And while it is helping patients get vitally needed surgery, it is different from the chilling that is experienced in accidental exposures to very low temperatures. The patients are gently put to sleep before the chilling. This saves them from the stressful state of great cold which can be fatal. For explorers or servicemen who might be exposed to freezing, survival might be possible if the stress could be prevented. The Chicago woman who recovered after being frozen stiff in an alley was "well anesthetized," according to one authority, by alcohol consumed before she froze.

Various drugs are now being experimented with in the hope of finding one that could prevent the stress state in freezing. Then, perhaps, men likely to be lost in very cold regions could carry with their emergency rations a supply of hibernating pills. Swallowing a few of these might enable them to have a ground hog's nap until rescuers arrived to awaken them.

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NUTRITION

## Seek Food Source In Scum on Ponds

➤ EFFORTS TO mass-produce algae, seen often as the blue-green scum on ponds, as a possible food source will be supported by a $30,000 grant to the University of Texas for a three-year period, Dean Rusk, president of the Rockefeller Foundation, announced in New York.

The algal research program is being directed by Dr. Jack Myers, head of the university's Laboratory of Algal Physiology. For the immediate future, Dr. Myers proposes to search for new algae with characteristics of possible experimental or economic importance, to study algal metabolism, and to attempt the complete carbon dioxide reduction of blue-green algae.

Science News Letter, June 4, 1955


**WASHINGTON SCHOOL COLLECTION**

This collection has been popular for years in High Schools. It includes 20 of the most important and common Rocks and also 20 common minerals. Each of the 40 specimens is about 2" in size and imbedded in cotton in a strong partitioned box size 10 ½ x 16 ½ x 1 ½". A set of unlabeled small specimens for quiz and identification purposes is included without extra charge. Price $7.00 prepaid. Booklet, Introduction to Geology for the Layman 50¢. Catalogue 50¢.

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STATISTICS

# Soviet Population Puzzle

**Census expert says statistics from behind iron curtain are true, but complains that they are presented piecemeal, making them difficult to analyze.**

➤ POPULATION FIGURES from behind the iron curtain are a headache to the experts who try to make use of them.

The figures themselves are not falsified, U. S. census experts found. But they are presented in a piecemeal fashion that makes them hard to interpret or compare with one another. And they are often presented in a way that seems intended to confuse or misinform, Drs. Norman Lawrence and W. Parker Mauldin of the U. S. Bureau of the Census reported to the Population Association of America meeting in Princeton, N. J.

If the iron-curtain countries were releasing falsified data to deceive the non-Communist world or to sell the Soviet system, this would require a system of double bookkeeping, Dr. Lawrence explained to the meeting. They certainly would not want to deceive their own planners.

In four years of work in trying to make sense of the iron curtain data, the experts found no evidence that figures exported to the rest of the world differ from those for internal consumption.

Where American experts are hampered is in lack of background information on how the data were collected and what they include.

For example, a statement in Pravda on Oct. 19, 1954, said that the "mortality rate declined in 1953 compared with 1940 by 51%." Elsewhere, the rate for 1953 was given as 8.9 per thousand.

A former responsible employee of the Ukranian Central Statistical Office has told American experts that in her time death certificates for slave labor camp inmates were tabulated separately and never included in the figures released for publication. Were they taken into account in figuring the Soviet crude death rate? Experts can only guess.

No one here, and few within the Soviet Union, know either the number of slave laborers or their crude death rate. Dr. Lawrence figures that if there were 8,000,000 slave labor camp inmates in 1953 and they had a crude death rate of 50 per thousand, the crude death rate for the U.S.S.R. would be about 10.5 instead of 8.9. So it would seem that they were left out, although it was presumably the intention of the Soviet authorities to have people believe the death rate applied to the entire population.

When Communist data are deliberately falsified, it appears to occur on a local level and is intended to deceive the authorities themselves. Indeed, such falsification is complained of by Soviet publications which urge statistical workers to "report to the appropriate prosecuting and police officials all such cases they find."

Sometimes the false figures are a help to American statisticians, however.

The school officials of Akmolinsk oblast were taken to task for falsifying school enrollment records to show the number of children supposed to be enrolled instead of the actual number. The faked figures were undoubtedly intended to cover up shortcomings in the local school system, Dr. Lawrence explained. But statisticians this side of the iron curtain can get a much better estimate of the school-age population from the faked figures than they could from actual school enrollments.

Science News Letter, June 4, 1955

PUBLIC SAFETY

## Would Blueprint Burn Care for Mass Disaster

➤ PLASTIC SURGEONS should prepare blueprints for the care of burn casualties and make the blueprints available to hospitals all over the country as preparation for mass disaster, Dr. George F. Crikelair of New York declared at the meeting of the American Association of Plastic Surgeons in Washington.

Dr. Crikelair, now assistant attending surgeon at Presbyterian Hospital, New York, was a Naval lieutenant at the time of the Bennington explosion on May 26, 1954. He was sent to the U. S. Naval Hospital at Newport, R. I., to help treat the most severely burned sailors from the aircraft carrier.

Besides Dr. Crikelair, doctors from the Naval Hospital at Bethesda, Md., shuttled back and forth by plane during the emergency period, bringing in stored dried skin and other supplies and carrying out extensive blood chemistry and radioactive isotope studies.

The exposure method of treatment, with burned areas left unbandaged, was used with all patients. This necessitated inspection of the burned areas two or three times daily, but avoided time-consuming changes of bandages.

Starting nine days after the disaster, 26 skin grafting operations were performed on the 21 most serious burn cases, with as many as four men grafted in a single day. Sometimes the tedious job of grafting skin onto a hand took an entire morning, Dr. Crikelair said, and the skin grafting of a face often took most of a day. Skin for some of the operations was secured from the men's own lower abdomens and buttocks.

Science News Letter, June 4, 1955

ASTRONOMY

## Supernova Discovered In Distant Galaxy

➤ DISCOVERY OF a supernova, a star that suddenly blazes forth with 100,000,000 times its former brilliance, was announced by Harvard College Observatory, Cambridge, Mass.

The spectacular object is in the constellation of Serpens, the serpent, now visible in the southern sky. Despite the supernova's extreme brightness, its magnitude is only 14, too faint to be seen without a large telescope.

If the newly discovered object were placed at a distance where the sun would be barely visible to the unaided eye, it would appear four times as bright as the full moon.

The supernova was spotted by Dr. Hans Haffner of Hamburg Observatory, Bergedorf, Germany. News of its discovery was cabled to Harvard College Observatory by Miss Julie M. Vinter-Hansen of the University Observatory, Copenhagen, Denmark.

Science News Letter, June 4, 1955

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2. Whatever your project may be—read about it. Learn what has already been done. It is often desirable to repeat previous experiments, but it should be done deliberately and for a purpose.
3. Write what you did, not merely what you read. Tell it in simple language; follow it through step by step. Then tell what you observed as a result of your experiments, and what conclusions you draw from these observations.
4. Fancy writing has no place in science. There has been great writing in the sciences but it is the greatness of strength and simplicity.

WRITE A REPORT of about 1,000 words on the subject, "MY SCIENTIFIC PROJECT." Your report should tell what you are doing or plan to do in science in the way of experimentation or other research activity. It should be original and creative in character. Now is the time for high school seniors of 1956 to get started on science projects. With an early start you can plan a project, carry it through more carefully, write a better report on it. Next December take an examination which tests your ability rather than your fund of information. Supply your school with information about yourself to be sent in with your report and examination papers.

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# Books of the Week

**For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.**

THE AMERICAN SOUTHWEST: A Guide to the Wide Open Spaces—Natt N. Dodge and Herbert S. Zim—*Simon and Schuster*, a Golden Regional Guide, 160 p., illus., cloth $1.95, paper $1.00. Information for visitors on the plants, animals, geography and prehistory of the region.

AUTORADIOGRAPHY IN BIOLOGY AND MEDICINE—George A. Boyd—*Academic*, 399 p., illus., $8.80. Written for the researcher who has never before done autoradiography. Techniques are presented in "cook-book" style.

BASIC LUBRICATION PRACTICE — Allen F. Brewer—*Reinhold*, 286 p., illus., $6.75. Serving as a text for trade school students and presenting information of value to the operator of industrial and power plant machinery.

CURRENT TRENDS IN PSYCHOLOGY AND THE BEHAVIORAL SCIENCES—John T. Wilson and others—*University of Pittsburgh Press*, 142 p., illus., $4.00. A series of six lectures under the auspices of the Department of Psychology in the College of the University of Pittsburgh.

THE ELEMENTS OF ASTRONOMY: A Nonmathematical Textbook for Use as an Introduction to the Subject in Colleges, Universities, etc., and for the General Reader—Edward Arthur Fath—*McGraw-Hill*, 5th ed., 369 p., illus., $5.50. Presenting the main facts of the subject together with necessary physical concepts and methods involved in modern astronomy.

AN ESSAY ON RACIAL TENSION—Philip Mason—*Royal Institute of International Affairs*, 149 p., $1.50. An attempt at a detached view of the problem by an author whose personal experience has been in India.

FRAMEWORK FOR ATOMIC INDUSTRY: A Commentary on the Atomic Energy Act of 1954—Herbert S. Marks and George F. Trowbridge—*Bureau of National Affairs*, 119 p., plus 5 appendices, paper, spiral binding, $12.50. Describing the changes which this act makes in prior law, especially as the changes affect the opportunity for private interests to take a larger part in the development of atomic energy.

GENERAL PHYSICS—Oswald Blackwood and William Kelly—*Wiley*, 2d ed., 704 p., illus., $6.75. A text for college students whose preparation in mathematics stopped short of calculus.

A GUIDANCE PROGRAM FOR RURAL SCHOOLS—Glyn Morris—*Science Research Associates*, Practical Ideas in Education Series, 46 p., illus., paper, $1.00. A reference booklet for all educators who work with rural youth.

HI-FI MANUAL—Donald Hoefler—*Arco*, The Do-It-Yourself Series, 142 p., illus., $2.00. For enthusiasts about a very popular hobby.

MAN IN A COLD ENVIRONMENT: Physiological and Pathological Effects of Exposure to Low Temperatures—Alan C. Burton and Otto G. Edholm—*Edward Arnold (Williams & Wilkins)*, 273 p., illus., $6.75. Discussing acclimatization to cold as well as the pathology of cold injury and resuscitation.

MANPOWER RESOURCES IN THE BIOLOGICAL SCIENCES: A Study Conducted Jointly by the National Science Foundation and the United States Department of Labor, Bureau of Labor Statistics—Solomon Shapiro, Joseph Schuster and Helen Wood—*Govt. Printing Office*, 53 p., illus., paper, 40 cents. Biological scientists are an older group than physical and earth scientists; the average age is 39.

MEASUREMENT AND EVALUATION IN PSYCHOLOGY AND EDUCATION—Robert L. Thorndike and Elizabeth Hagen—*Wiley*, 575 p., illus., $5.50. Developed from a course at Teachers College, Columbia, this text is a practical one for the person who is going to use and interpret tests.

PROCEEDINGS OF THE EASTERN JOINT COMPUTER CONFERENCE: Theme: Design and Application of Small Digital Computers—C. W. Adams and others—*American Institute of Electrical Engineers*, 92 p., illus., paper, $3.00.

RESEARCH COUNCIL OF ALBERTA THIRTY-FIFTH ANNUAL REPORT 1954—G. E. Taylor, Chairman—*Research Council of Alberta*, 47 p., illus., paper, free upon request direct to publisher, University of Alberta, Edmonton, Canada. Reporting "encouraging progress" on various research projects.

RESERPINE IN THE TREATMENT OF NEUROPSYCHIATRIC, NEUROLOGICAL, AND RELATED CLINICAL PROBLEMS — Fredrick F. Yonkman, Frank L. Mohr, and Jock L. Graeme, Conference Co-Chairmen—*New York Academy of Sciences*, Annals, Volume 61, Art. 1, 280 p., illus., paper, $3.50.

SOFT WATER IN MODERN USE: A Factual Presentation Based on a Comprehensive Study—Cornelia A. Tyler—*Water Conditioning Research Council*, 42 p., illus., paper, $2.50. Describing the principal methods for softening water.

TEA: A Symposium on the Pharmacology and the Physiologic and Psychologic Effects of Tea—Henry J. Klaunberg, Ed.—*Biological Sciences Foundation*, 64 p., paper, $1.00. Describing the physiological, psychological and medical benefits to be derived from a "spot of tea."

TRENDS IN LAND ACQUISITION—David R. Levin, Chairman—*Highway Research Board*, Bulletin 101, 82 p., paper, $1.50.

YOUR CAREER IN PHYSICS—Philip Pollack with an introduction by Marsh W. White—*Dutton*, 127 p., illus., $2.75. Describing for high school students the opportunities available in this field and the training necessary to take advantage of them.

Science News Letter, June 4, 1955

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MEDICINE

## 90% Lung Cancer Cases Found by Sputum Test

➤ LUNG CANCER can be detected in more than 90% of the cases by microscopic examination of the sputum, Drs. Seymour Farber and David A. Wood of the University of California School of Medicine found in a study of more than 1,000 lung cancer patients.

Operation to remove the cancer might be performed in time to save life in many more cases if this examination were made whenever there is even a suspicion of lung cancer.

The doctors point out that the examination is relatively accurate, easy for an experienced pathologist to perform and sufficiently inexpensive for use whenever cancer is even a remote possibility. They strongly suggest that it should be made a routine part of the semi-annual check-up of men over 40, since this is the group which appears most liable to lung cancer.

Directions from the California doctors are that sputum should be collected first thing in the morning if possible and prepared for examination within a few hours, before it has a chance to dry. Five such sputum samples must be collected on five different days if a high degree of accuracy is to be maintained.

In the 1,036 patients they examined, the most common early signs of cancer were 1. a persistent wheeze, 2. a cough that "hangs on," 3. a "cold I cannot shake off," 4. frequent bouts of pneumonia, 5. chest pain, even of a minor nature, 6. blood-streaked sputum and 7. intermittent fever due to no known cause.

Science News Letter, June 4, 1955

## Questions

**AERONAUTICS**—How is a searchlight used to direct air traffic? p. 359.

□ □ □

**ELECTRONICS**—What does the scanner do in the new TV color pickup system? p. 355.

□ □ □

**GEOPHYSICS**—The central part of the Arctic Ocean bottom resembles that of what other body of water? p. 358.

□ □ □

**MEDICINE** — What is the new suggested treatment for bronchitis? p. 354.

□ □ □

**PHYSICS**—Why should a model of space look like Swiss cheese? p. 361.

□ □ □

*Photographs:* Cover, Chas. Pfizer and Co.; p. 355, Allen B. DuMont Laboratories, Inc.; p. 357, General Motors Research Laboratories; p. 359, Westinghouse Electric Corporation; p. 362, Fremont Davis; p. 368, E. I. du Pont de Nemours and Co., Inc.

ENTOMOLOGY

# NATURE RAMBLINGS

**Lady-Beetle**

*"Ladybird, ladybird, fly away home.*
*Your house is on fire, your children will burn."*

➤ THIS CHANT has been a favorite for children for no one knows how long. For these bright little beetles, more ready than most of their kin to use their wings, are very attractive to the youngsters.

It is easily understandable that an early and naive natural history should have called these apparently harmless, gentle insects "ladybirds." But more recent and careful investigations have shown that by rights they should be known as "leopard beetles," for they are among the most voracious little hunters in the insect kingdom.

There are many species of ladybirds, but in general they all resemble a tiny round pill cut in half. Their short legs are attached to the flat side of their body, and they run as fast as these short legs can carry them, first in one direction, then in another.

The ladybird comes in a variety of colors. Sometimes she is black with red or yellow spots, sometimes red or yellow with black spots, but always her coat is shining. Fast as her legs will carry her, the ladybird is still slow-moving, like most of the round beetles. The lady's prey, however, is slower still, for it consists mainly of aphids, scale insects and similar plant parasites.

This predacious habit on the part of the ladybirds naturally makes them valuable friends of man, for our gardens and orchards suffer heavily from the inroads of these pests. The fruit-raising industry particularly pays millions in involuntary tolls to various types of scale insects. In some regions, notably California, capturing wild ladybirds and turning them loose in the groves has become a very important horticultural practice.

The ladybirds commonly winter in the debris on the forest floor in the woodlands of the higher hills, and to these places the gatherers go, shaking and sifting them out of their winter nests. The beetles are as a rule too sleepy to mind, and they are carefully kept at the proper temperature in cold storage until spring.

Science News Letter, June 4, 1955

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METEOROLOGY

## Rain Making Succeeds In Tropical Clouds

➤ THE CHANCES of rain forming in warm tropical clouds is doubled if seed water is dumped into them, a University of Chicago meteorologist told the American Meteorological Society meeting in Washington.

Dr. Horace R. Byers reported, for the first time, success is making rain in statistically designed experiments. There was only one chance in 50 that results were pure luck, he said.

Starting of rain in the tropical clouds by water seeding was spotted by radar echoes, but whether the rain actually fell to the ground was not determined in the experiments, supported by the Air Force and conducted over the open sea near Puerto Rico.

Other rain-making studies made over the semi-drought areas of southeastern Missouri and nothern Arkansas, using dry ice instead of water as seeding material, produced no results, Dr. Byers reported, because there were not enough clouds to conduct statistically designed experiments.

To eliminate differences in cloud characteristics that might vary from day to day, two paired clouds were selected on each day of flight, but only one was treated.

Radar sets, especially designed by Louis J. Batten of the University, detected echoes from the cloud only when droplets induced by the water dumped into it had grown to raindrop size.

Dry ice was used to seed clouds in the Midwest studies because clouds in these latitudes often rise to levels where below freezing temperatures are found before producing rain. Moisture in such clouds usually remains as water droplets, even though temperatures are below freezing. The dry ice cools some of these droplets to much lower temperatures and changes them into snowflakes.

Science News Letter, June 4, 1955

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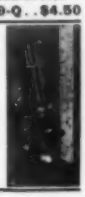

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*UTILITY LANTERN has a battery which is the battery case too. Measuring four by five inches, the sealed in steel leak-proof battery has a twin light head and no wires or battery spring contacts. Independently operated lights provide a sealed beam spotlight and a flashing red warning light.*

Science News Letter, June 4, 1955

*SUMP PUMP is automatic and submersible for year-around protection against water damage. Weighing 35 pounds, the portable pump is 11 inches high and 9 5/16 inches at its greatest width. All pumping parts are made of bronze and the 1/3 h.p. motor is hermetically sealed in a steel case.*

Science News Letter, June 4, 1955

*PLASTIC JUICER offers housewives quick squeezing of an orange, lemon or other citrus fruit. It consists of a bowl and a slip-on-top with a rigid cone center for squeezing. Molded of polyethylene, easy-to-clean unbreakable plastic, the bowl is ribbed for easier handling.*

Science News Letter, June 4, 1955

*SAWHORSE CLAMPS are designed to permit rapid assembly or disassembly. Made from 16-gauge zinc-coated steel, a pair of clamps and five pieces of 2 x 4 lumber make a sawhorse of any desired length. Twelve grippers, actuated by one lever, hold wood in place and eliminate the need for tools, nails, miters or other fasteners.*

Science News Letter, June 4, 1955

*SPONGE-YARN MOPS leave no lint or strings and can be easily cleaned. The cellulose sponge floor mops, shown in the photograph, can also be used interchangeably as a wet mop or a wax applicator. Properly cleaned after being used, they will not sour or mildew.*

Science News Letter, June 4, 1955

*SILICONE CENTERED golf ball for milady promises to give the woman golfer longer drives. Specially constructed for a woman's swing, the new ball meets all required specifications of the U. S. Golf Association. It weighs 1.62 ounces, measures 1.68 inches in diameter and has an initial velocity of 250 feet per second.*

Science News Letter, June 4, 1955

*ELECTRIC FISH scaler does the job five times faster than the old methods and does not tear the fish skin. A plastic shield prevents scales from flying. Scaler comes in a kit including a carborundum stone for sharpening hooks, a rise for tying flies, a felt wheel for polishing tackle and a small brush for cleaning reels.*

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*POOL LINERS and pool covers designed for do-it-yourself swimming pools are made of strong and durable plastic. Available in three sizes and graduated in depth, the liners are unaffected by oils, grease, and water purifying chemicals and can be left in the pool all year long. Washing with soap and water will keep the plastic clean.*

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6-4-5


## *Do You Know?*

A world *population* of 4,000,000,000 persons is foreseen by the end of the century.

One *wormwood* plant, a weed, produces as many as 1,075,000 seeds.

*Termites* attack wood fiber for food, cellulose being the insects' chief nutrient.

Annually 10,000 women who get *cancer* are now being cured who would have died ten years ago.

The sea contains almost all the world's soluble *fertilizers* needed to increase productivity of exhausted soils.

The automobile industry uses almost $80,000,000 worth of *cotton* in its products in one year.

Geological evidence has been found that upper Michigan was covered with *glaciers* more than 500,000,000 years ago.

World demand for *oil*, which is now 14,100,000 barrels a day, is expected to raise to 40,000,000 or 45,000,000 barrels a day by the end of the century.

Science News Letter, June 4, 1955